Installation Manual
Honda VTX 1800
Version 2

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Introduction

This manual covers installation of the LegUp LandinGear system by Chopper Design Services. This system should only be installed by a qualified technician, or those with above average mechanical skills. If you are not SURE that you can perform this installation, please contact us and we will help you find a qualified shop to assist you.

If you have been looking for a system that will keep your feet on the pegs, this is NOT the system for you! On the other hand, if systems that will relieve you of the weight of the bike and help you avoid balance problems as you approach a stop, LegUp is what you need.

Improper installation will void your warranty, so please be very careful!

Thanks for choosing LegUp!

Warranty

Chopper Design Services warrants the LegUp system for a period of one year from date of purchase. This warranty covers replacement parts and/or manufacturer defects. Incidental damages or costs are the responsibility of the purchaser.

Defective parts are to be returned to Chopper Design at the address below. Purchaser must contact Chopper Design to receive a Return Material Authorization, prior to returning defective parts to Chopper Design.

Abuse, improper installation or use, collisions or accidents, are not covered under this warranty. Replacement parts for this type of damage are available through Chopper Design.

Users of the LegUp system agree that Chopper Design is NOT responsible for personal injuries or damage to property arising from the use of the system. While we believe this system to be safe and reliable, the user is advised that use of LegUp is done so at the users' own risk. Use of the system implies agreement to the above statements. If you can't agree with the above, Chopper Design and its dealers would be happy to refund your full purchase price, before you use the LegUp System.

Chopper Design Services
1365 Bennett Dr. #101
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Installation Instructions

The LegUp® system has many components. Pleased be sure you have them all before starting your installation.

COMPONENTS:

1) **Control Switch Box**

2) **Linear Actuator**

3) **On-board Computer Module**

4) **Proximity Sensor**

5) **Leg Support Stand**

6) **Leg/Wheel System**

7) **Hardware Bag**

8) **Actuator Bracket**

If you believe you are missing any parts, please contact Chopper Design at 407-834-5007, and we will rectify the situation.

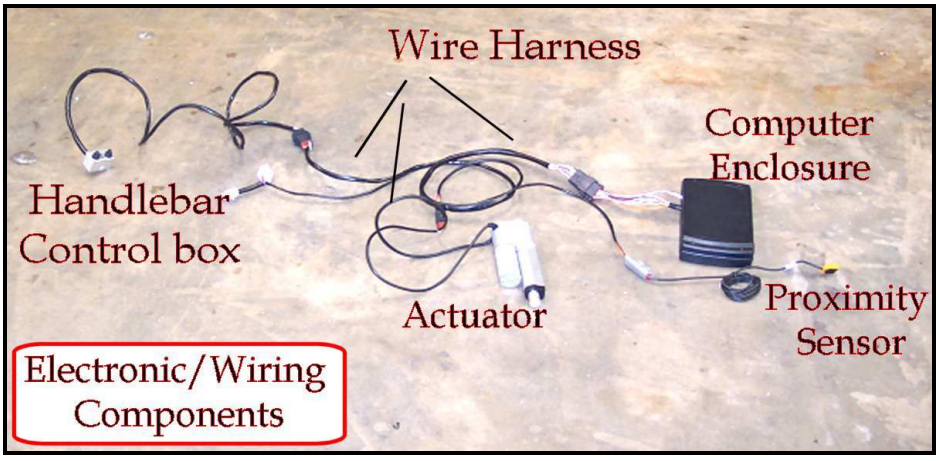


Figure 1

PREPARE FOR INSTALLATION

Place the motorcycle on an acceptable bike lift. You will need to keep the bike on its wheels for most of the installation, and jack the rear wheel off the lift for some portion of the installation. Make SURE the motorcycle is secure on the lift!

Remove the seat and both side covers.

We are now ready to begin!

ACTUATOR BRACKET

The actuator bracket mounts to the vehicle on the left side. You must first remove the left passenger foot peg; save the bolts! The two bolts that hold the foot peg are on the inside of the frame near the swing-arm.

Once removed, find the upper actuator bracket (flat bracket with aluminum piece bolted to it). The holes on the left side of the bracket line up with those in the foot peg support.

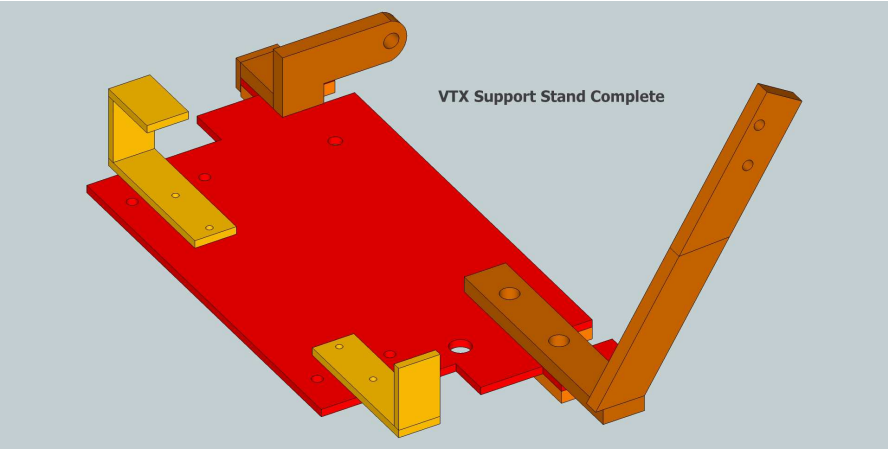
This part is a bit tricky. First use Loctite on the bolts you just removed, and put one through the upper actuator bracket, then the foot peg mount and get the bolt started threading into the bike. It is very tight and it can be frustrating so be patient here.

Once the first bolt is started, line up the bracket and the foot peg mount, and guide the second bolt in and just start the threads.

At this point you should snug the bolts just a bit; final tightening will occur after we get the support plate mounted. Below we see Ben using a ratcheting wrench to tighten the bolts (Recommended), but an open end wrench would work as well! The mount holes on the upper actuator bracket are a bit oversized to make this job easier. As you snug the bolts, try to get the bracket level to the ground as best you can.

The next step is to mount the support stand!

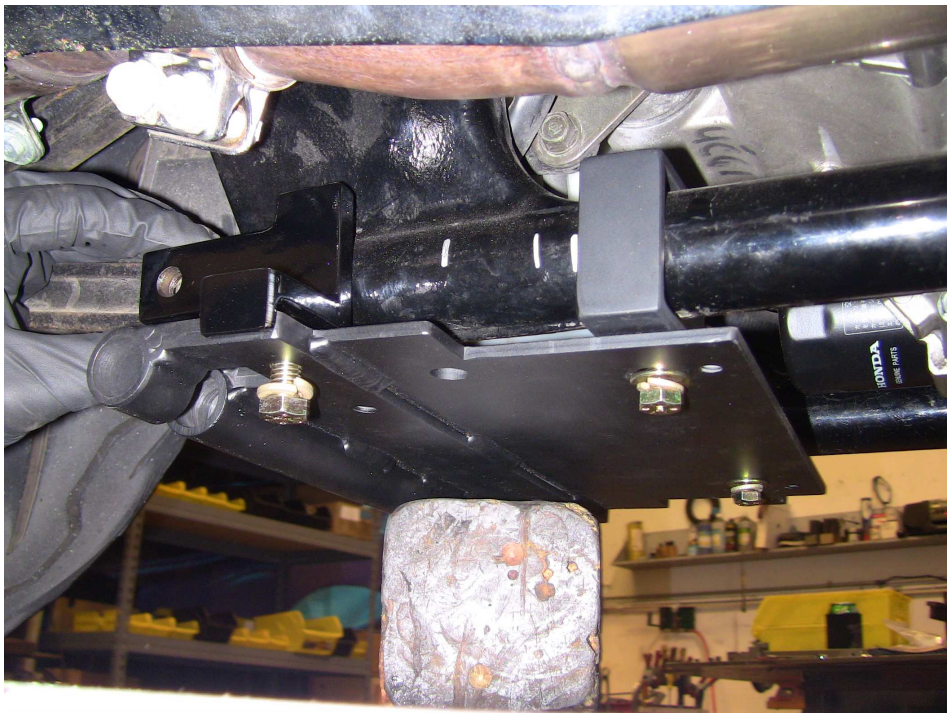
INSTALL LEG SUPPORT STAND



LegUp has developed a new, stronger attachment system which holds the LegUp system to the bike! This stand mounts below the transmission on the VTX.

If inserted into the stand, the long stainless steel shaft with the small bolts in the end should have one of the bolts removed, and be slid out of the pipe in the stand. Just set this aside for now.

In preparation for installing the stand, remove the bolt on the bottom right of the Exhaust Support Bracket (right side of bike). Set the bolt aside as it will not be re-used. The 'Right Rear Upright' should be installed on the plate, as should the two front brackets (yellow above). The 'Right Rear Upright' should be bolted down tightly (it is loose in the picture) and the front ones should be loose enough to move.



Slide the stand under the bike from the right side, allowing the front right upright to capture the frame, and line the rear upright with the hole in the exhaust mount that you took the bolt out of. You may wish to have help here and support the plate on a block of wood as seen here. We supplied you with three washers to be used as spacers between the rear upright and the exhaust bracket, as well as a new bolt to hold it to the bike. Insert the washers behind and the bolt through the hole in the mount, into the exhaust bracket and start the threads (**Do Not Tighten all the way yet!**) This bolt, like all others should have a bit of Blue Loctite on it before installing!

Now get the ‘Right Rear Upright’ and two 3/8” bolts with lock washers. Set the bracket near the bike, with the top behind the upper actuator bracket you installed earlier.

Start the two bolts in from the bottom of the bracket into the support plate, as shown here. Just get the bolts started; **DO NOT TIGHTEN YET!**

Once the bolts are in the support plate, you will need to line the top of this upright with the two holes in the actuator mount. Use a bit of Loctite on the chrome bolts (supplied), and run the bolts through the actuator bracket and into the threads on the upright you just installed. Snug these bolts a bit, but do not tighten fully yet.

Now we want to tighten the bolts that hold the bracket we just installed, the bolt that is in the muffler mount and the bolts that hold the upper actuator and the chrome bolts we just installed.

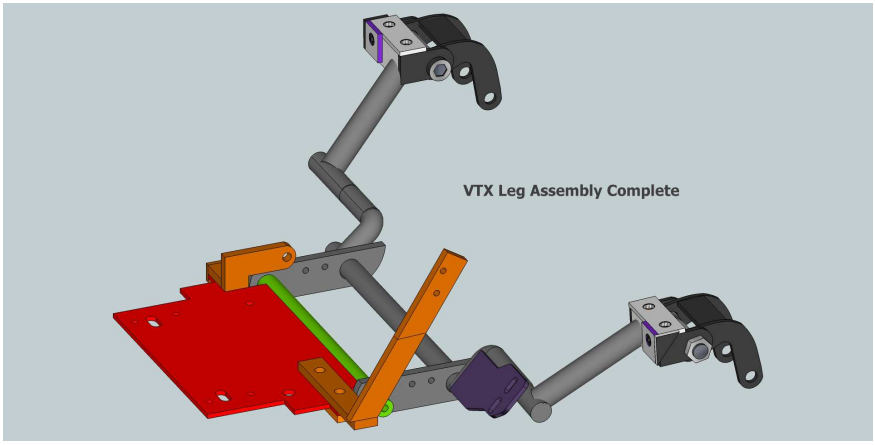
Tighten all of these a bit at a time. The goal here is to make sure the upper actuator bracket is about level with the ground and the support plate is also level, side to side.

Take your time and check as you go. Then we can tighten the bolts on the front of the plate. Make sure the brackets are touching the frame squarely and snug these bolts up all the way.

Tug on the bracket and support plate. It should be securely attached to the bike.

On to the next step!

LEG/WHEEL ASSEMBLY



If not completed already, first remove the bolts from the stainless steel rod in preparation for mounting the legs. With help from an assistant, slide the Leg/Wheel Assembly around the rear tire (careful of the finish!), and align the Leg Mounting Points with the slots in the Support Stand. If available a very small amount of 'Never Seize' on the shaft is in order here. Then start the stainless steel shaft in from one side through the tube on the support stand, and through the first leg mounting point and its bushing. The fit is tight, so take your time. Carefully work the shaft through the tube and the second leg mounting point. The shaft is inserted properly when it is inserted just past (approximately 1/8") the end of the tube. This distance should be about the same on both sides, but it is not critical as long as both sides are inside the tube. If you need to, you can tap lightly on the shaft (brass drift is preferred here). Once the shaft is in place, use a small amount of blue thread locker and install the (2) chrome bolts and washers on the end of the shaft to finish it off.

Make sure the legs move up and down without any binding!

MOUNT ACTUATOR

Remove the axles (if installed) from both the upper and lower actuator mounts (aluminum blocks - one on the legs and one on the upper actuator mount), and set them aside. Align the actuator, motor side (big end) up as shown, with the hole in the upper actuator mount. Reinstall the axle bolt on the upper actuator mount first. Use just a touch of thread locker on the threads.

With someone supporting the wheel assembly, raise the legs until the bottom hole in the actuator is aligned with the lower actuator mount (which uses bolts from underneath to hold it on… these bolts should be snug, but can be loosened later if adjustment is required!). Install the axle in this mount as you did on top one. (Some wiggling may be required!).

NOTE: If the actuator is too short to reach the other mount you may have to lengthen it using the system. Temporarily plug the wiring harness into the bike, and follow the direction for 'Maintenance Mode' in the 'Initial System Test' section below. Using what would be the left button on the switch box, just add a small amount of length to the actuator so you can align the mounts, then turn the bike back off.

At this point you need to make sure that the mounts are in alignment and the actuator is not in any sort of bind! The mounts should be tightened at the factory. If need be, readjust the actuator mounts in whatever position is the best with the actuator in its mounts. If needed, mark the mounts with a Sharpie, remove the actuator, tighten the mounts and reinstall the actuator. Make sure the axles slide in easily and there is no bind at all. **MAKE SURE** there is no bind or the actuator will fail prematurely!

CONTROL SWITCH BOX

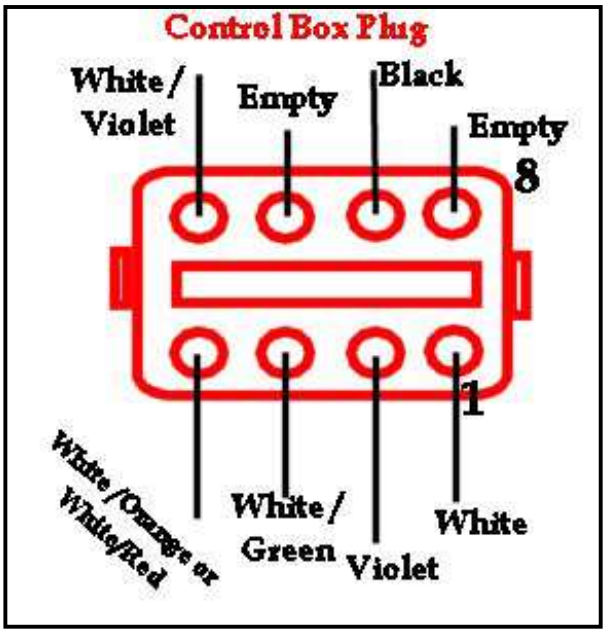
NOTE: If you have a LITE System, Please refer to the addendum at the end of this manual, for differences between a Regular and LITE system. The Proximity sensor is NOT part of the LITE system! Ignore any references to the Proximity Sensor, its' mount & wiring.

Disassemble the 8-pin connector attached to the switch housing and the 3 pin connector attached to the speed sensor (yellow on a black bracket). Run the wire from the speed sensor bracket (which mounts on the left fork by the brake) up to the tank area to join the switch wires. The switch wires will run along the handlebar down to the under tank area. You will need install the switch box on the handlebar, then run the wires down the handlebar and meet the speed sensor wires near the front of the tank.

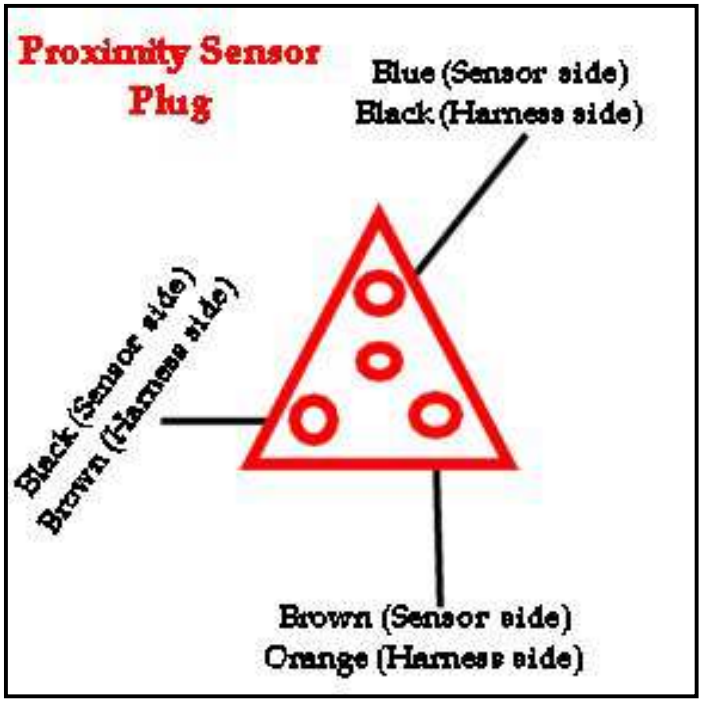
First we will mount the switch housing, so we can start to run the wires. Remove the two bolts from the clutch perch and mount the switch housing bracket using two chrome bolts, then the bracket, then spacers, into the outer clamp then the clutch perch. Tighten these bolts.

Now we can run the wires from the switch housing down the handlebars and toward the front of the tank. Use wire ties to attach the wires to the bars.

We need to take the wires from the proximity sensor (little yellow thing on a black bracket) and join them with the handlebar wires. Run these wires under the tank area to get to the rear seat area (seat removed of course!). Don't tie the wires off completely yet as we have not installed the proximity bracket, and we want to make everything neat and take any slack we have to the under seat area. For now, just get the wires under the seat.

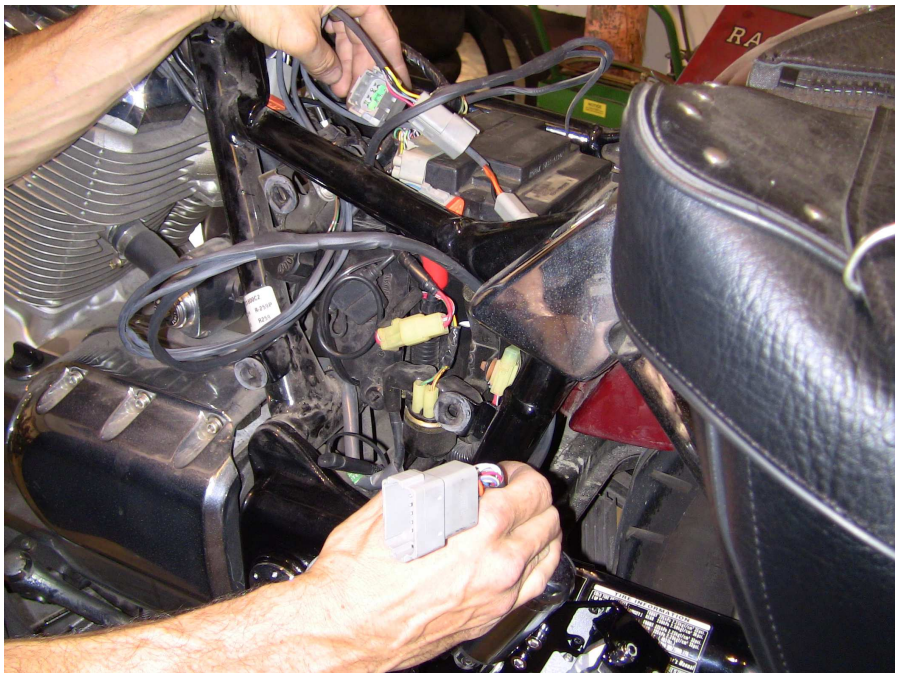


This would be a good time to re-assemble the plugs from the switchbox and the proximity sensor. Be careful to assemble these according to the pictures (switch box left, speed sensor right, below).



WIRING HARNESS

NOTE: If you have a LITE System, Please refer to the addendum at the end of this manual, for differences between a Regular and LITE Harness!



The next step is to route the wiring harness. The harness and the plugs are routed mostly under the seat area cover and side covers. We already ran the wires from the handlebar switch and the speed sensor.

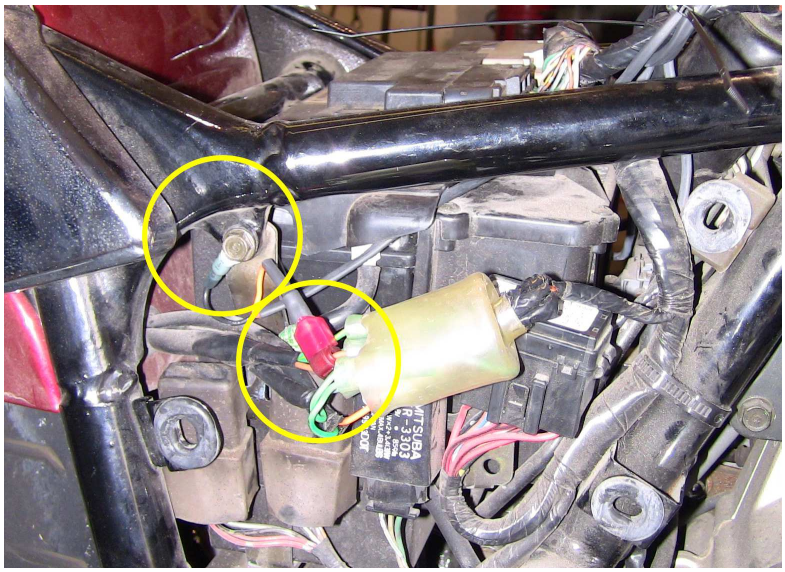
The actuator wire and plug should be run into the left side cover area. The harness plugs for the handlebar switch (8 conductor) and the speed sensor (three conductor plug), should be run up from the left side cover area, to under the seat area (most extra wire will be tied up under the left side cover). The big plug needs to be tucked under the frame member of the left side cover, behind the shock and into the left saddlebag, where it will join the computer. Optionally you can mount the computer in the left side cover if you don't have saddlebags! We did; see the picture on the next page.

The picture to the left shows the plugs and wires tied up nicely under the seat.

The small 2 wire (orange and black) power lead needs to be routed under the right side cover.

Let's review: Eight pin plugs and three pin plugs; under the seat. 6 pin plugs; under the left side cover. Twelve pin plug and computer; in saddlebag. Power wire (orange with red plug on it and

black with hoop connector); right side cover. If you have all these placed properly, plug all mating plugs together (they only fit one way) and plug the computer in as well.



We now need to get power to the system. The two wires for this should already be under the right side cover. We got our 12V from the brown wire under the rubber cover in this area. We used a snap on connector (supplied) to grab the brown wire. Then you can plug in the spade connector attached to the orange wire.

The black wire gets connected underneath the mounting bolt seen here.

Our system draw under 5 amps, so most circuits can handle this type of load. Once completed, it should look something like the picture above.

Here is the shot of the computer attached with supplied Velcro to the inside of the left side cover. It is tight, but it can fit!

INITIAL SYSTEM TEST

NOTE: If you have a LITE System, Please refer to the addendum at the end of this manual, for differences between a Regular and LITE system. Skip this section if you have a LITE System.

Turn your key switch on. At this point, have a look at the yellow proximity sensor (it should be dangling near the front forks somewhere). The **RED LED** (ON The Sensor) ***Should Not Be Lit***. Take a metal object (screwdriver, wrench, etc.) and hold it on the flat face of the sensor (it has a circle embossed in it). The LED should light up, and go out when you move the metal away. If not, check all your connections.

Next, press the rightmost pushbutton and hold it for at least 3 seconds. One or both LEDs on the switch panel should light up; we really don't care which at this point. If this occurs, you are doing well. If both LEDs are flashing (maintenance mode) you can skip the next step which is to press both buttons until both LEDs flash.

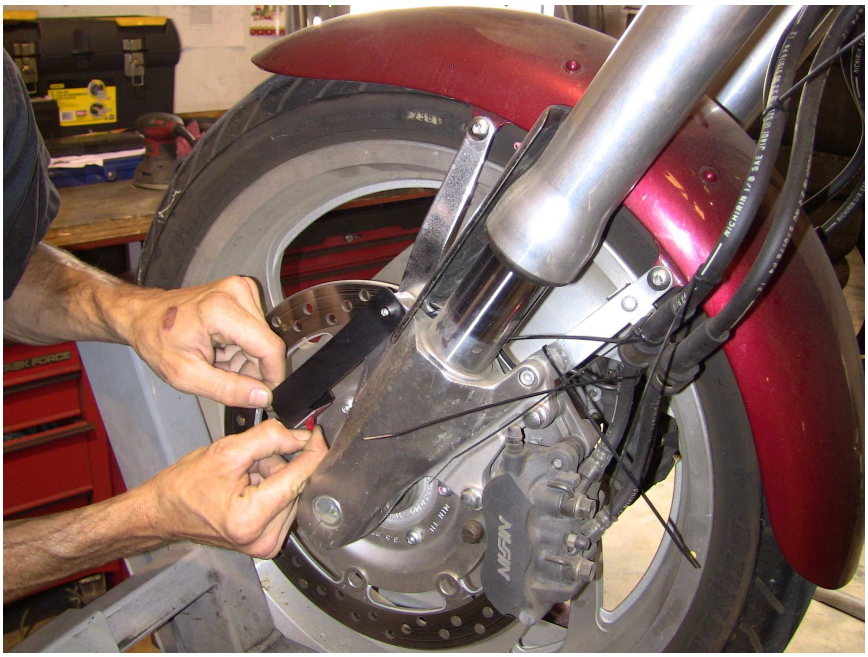
Next press both buttons for just an instant! If everything is working, the bottom or yellow LED on the switch box should flash, and the top LED should be out. The next step, and be careful here, is to touch the left button for a split second. The legs should move down just a bit. Touch the right button, and they should move up. With the bike on the lift, ***you have to be very careful here!***

If all of the above has occurred, raise the legs. Press and hold the right button until it stops, and turn the ignition switch off!

The test is now complete. Let's move on to mounting the Proximity Sensor.

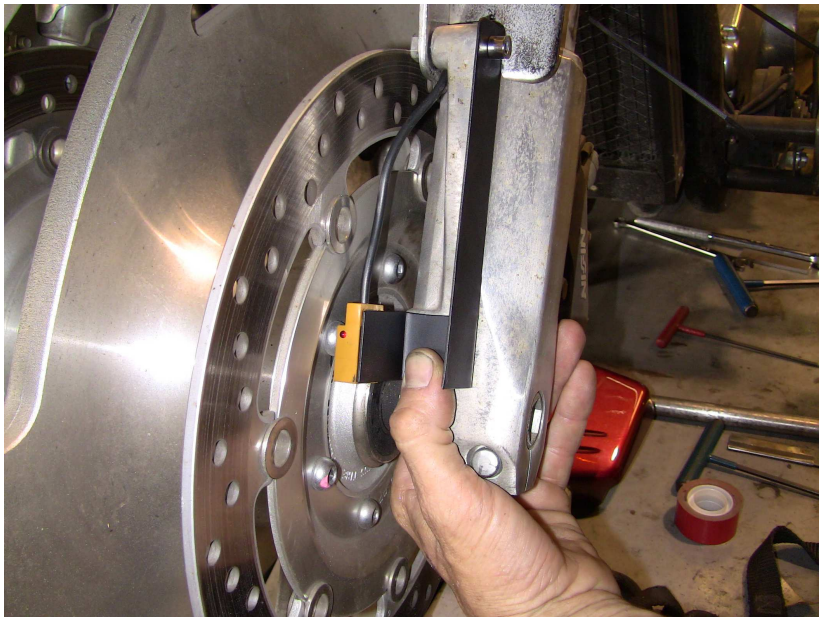
MOUNT PROXIMITY SWITCH

NOTE: If you have a LITE System, Please refer to the addendum at the end of this manual, for differences between a Regular and LITE system. Skip this section if you have a LITE System.



This step is crucial!!
Understand it before starting. The proximity sensor tells the system how fast the bike is traveling. The proximity sensor mounts to the lower front fork. The sensor will ultimately be mounted 5MM from the rotor bolts.

The bracket with sensor should be in the area of the left fork already. Guide it **INSIDE** the fork tube and find the included bolt. Align the bracket as you see here, and start the bolt into the threaded boss on the fork leg. Do Not tighten completely yet, but do add a bit of thread locker to the bolt. The bracket keeps from rotating by leaning on the fork leg and is attached using two-faced tape, to keep it in the position you choose.



It would be very helpful if you can jack the front wheel off the ground or lift for this operation. The idea here is to have the yellow proximity bracket line up with the rotor bolts and be placed no more than 5MM away from them as they rotate! The picture to the right shows the bracket perfectly aligned and the tape being pressed onto the leg to keep the bracket from moving in or out.

With a bit of Loctite, reinstall the bolt leaving it just barely tight for now. We want to make sure the wires will run properly and can be tied off to the brake line to disappear.

Now have a look at the bracket and the yellow sensor (red LED should be visible from the front). The yellow sensor should be within 5MM of the rotor bolts as they spin.

Now we need to have the bike on the ground or the front wheel raised, so we can make the rotor bolts pass the sensor, to test it and its placement. If on the ground, make sure the bike is in neutral.

Turn the ignition switch to the on position. The LED may or may not be on. What we are looking for here is for the LED to light as a rotor bolt passes close to the sensor and to go out as the bolt passes by. Have someone watch the LED as you roll the wheel or the bike back and forth making the bolts pass close to the sensor.

Once you feel you have the right place, tighten the bolt in the bracket down securely, and test again!

If this is not happening, you may need to get the sensor a bit closer to the bolts (5MM is a very small distance!). If you have to move the sensor closer, you may have to bend or adjust the angle of the bracket.

No matter what you need to do, you MUST make sure that as the wheel turns, the light works as described above! The automatic retraction of the legs as well as their deployment RELIES on this sensor being placed perfectly!

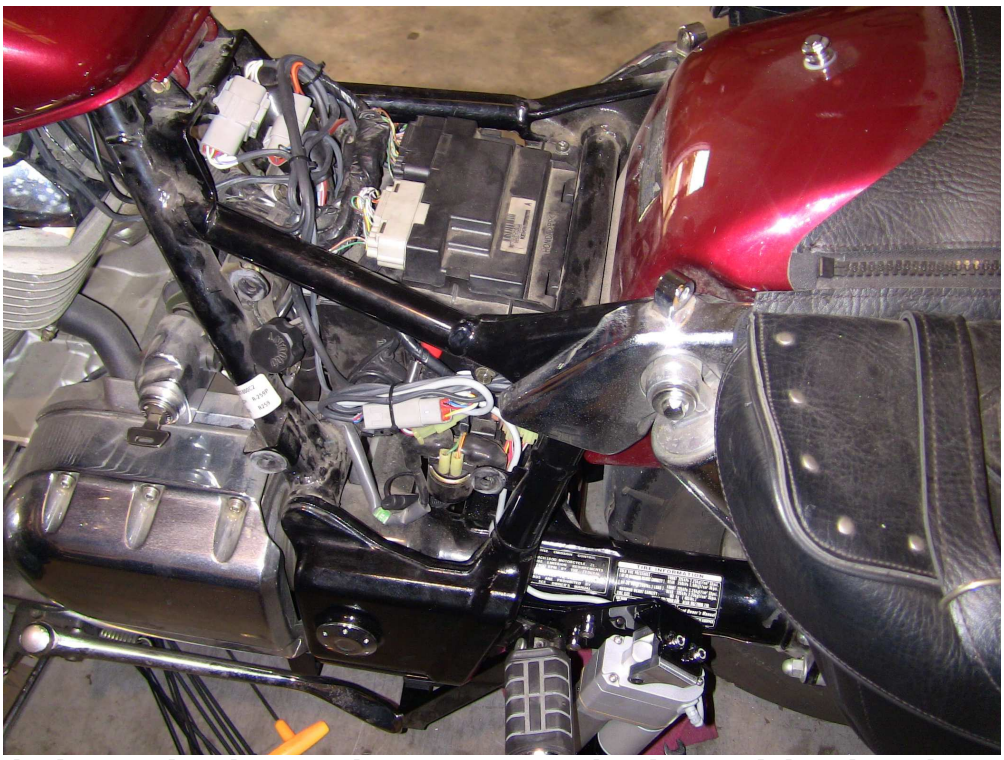
Once satisfied with the mount, skip down to the wire routing instructions below.

WIRE ROUTING

NOTE: If you have a LITE System, Please refer to the addendum at the end of this manual, for differences between a Regular and LITE system. The Proximity sensor is NOT part of the LITE system!

Guide the wires from the Proximity bracket up the brake line, and attach it to the line with wire ties. Once routed, make sure both this wire and the wires from the handlebars are secure and allow full lock of the handlebars both left & right! Take whatever extra slack from these two wires, and pull it back to the seat area!

Use wire ties to make sure that all wires will stay where you put them and that they will not come on contact with that moves. Loop any excess as shown at left. Keep the excess wire clean and make sure the seat goes up and down without hitting any wires.



With help, support the bike and turn on the LegUp system (see owner's manual). It should start in maintenance mode, but if it doesn't, please enter maintenance mode (again in the manual). Now carefully, lower and raise the legs and make sure the wires are not binding and that they clear everything! Raise the legs most of the way and turn off the bike. Now we are ready to button everything up.

FINISHING UP

Now it is time to recheck everything! Check that all bolts that were loosened are tight. Reinstall the side cover and the bags; making sure that everything is clear. Reinstall the seat making sure all your wires are routed neatly, tied off nicely and don't interfere with the seat installation.

Now you can dial in the actuator, and adjust the wheels.

ACTUATOR ADJUSTMENT (Maintenance Mode)

NOTE: If you have a LITE System, Please refer to the addendum at the end of this manual, for differences between a Regular and LITE system. Skip this section if you have a LITE System.

Once you have the bike on the ground, turn the ignition to the accessory position and start the LegUp System (hold right button for 3 seconds). The system should enter maintenance mode automatically (Both LEDs Flash), but if it does not, enter maintenance mode manually (Both buttons for 3 seconds). With a helper nearby, straddle the bike, and hold it level. Hit both buttons for an instant to get the system in the "DOWN" setting mode (yellow LED flashing). Straddle the bike so your weight is NOT on the seat, hit and hold the left button until the wheels contact the ground and stop. Make sure that the suspension raises a bit as you do this. If not, the legs are not going down far enough, the bottom actuator mount may need to be moved left or right a bit to get the wheels all the way down (Contact LegUp for assistance if you need help with this). Once these wheels are down as described above, try to put both feet on the floorboards. The bike should be reasonably stable and you should be able to lean a bit in both directions without the bike falling over. The DOWN stop is now set!

Hit both buttons for a moment to get into the "UP" stop mode (top LED blinking).

Carefully use the right button to raise the legs. Have your helper let you know as you approach anything that may come in contact with the wheels or the legs. You also need to make sure the system clears pipes, clamps etc. If you can't make the clearance to allow the legs to come up all the way, you can set the up stop just below whatever is interfering (if not, you will likely set up a permanent rattle!) Hit both buttons when complete, and you will be done with these adjustment.

Now press the left button and the legs should lower. Hit it again and the legs should retract. If you are satisfied with these limits, you have successfully installed the LegUp System. Time for a test ride!

TEST RIDE

NOTE: If you have a LITE System, Please refer to the addendum at the end of this manual, for differences between a Regular and LITE system. Deployment and Retraction of the wheels is COMPLETELY MANUAL if you have a LITE System.

Get the bike to a clear paved mostly level area where you can test ride it. Start the bike, turn on the LegUp system and lower the legs. The first test should be done in a straight line. Put the bike in gear and slowly accelerate. You may notice that the bike tends to want to steer a small amount left or right. This is normal unless it is severe. Once underway, the top LED should flash at around 6 MPH, meaning the legs are retracting. You can lean on one wheel or the other as you leave to reduce any darting the system may be giving you.

Assuming the legs are retracted, you should try to deploy the wheels. As you come to a stop, the Green LED should be on. As you slow down (**almost stopped**), the Yellow LED should illuminate at the proper speed. Once it does (sometimes hard to see), hit the left button and put your feet down near the ground. The top LED should flash and you should soon feel the wheels deploying underneath you! Make sure you are ready to balance the bike! Uneven ground or lack of familiarity could make the bike want to lean one way or the other. With your feet ready to balance the bike, this should be no big deal. The slower you are going when deploying the wheels, the smoother the transition will be from wheels up to wheels down. Practice these maneuvers until you are comfortable with the wheel adjustments and the system operation.

SEMI-AUTOMATIC DEPLOYMENT: Another way to deploy the legs is to hit the left button while you are running at any speed over 10MPH with the wheels up. The bottom or yellow LED should start to flash. When you slow down to around 8MPH the wheels will start to deploy (see the red/green flash on top LED). Again prepare to put your feet down.

NOTE: The bottom LED Should not be LIT if the legs are up over 10MPH! In the event it is, the wheels will deploy instantly if you try to set them as above; this is dangerous! You MUST re-visit the sections on testing the proximity sensor. You should always be aware that this light should NOT be on if you are traveling at speed, and 'Arming' the system for deployment should only be attempted if the lower LED is Not Lit! Please see the User Manual for more information on Proximity Sensor Failure!

The next thing to try is to make a turn right after a dead stop with the wheels down. As soon as you start the bike moving, try a left or right turn immediately by leaning into that turn. You may find that you have to nudge the bike a little bit more than usual to get the bike to lean, and you won't be able to lean as far as you can with the wheels up. Once into the turn, accelerating will raise the wheels. You will hardly notice the wheels coming up unless you see the top LED blinking!

The next thing to try is slow speed maneuvering with the wheels lowered. In a straight line on level ground, you should be able to keep your feet on the floorboards and move the bike forward at very slow speeds (simulate stop and go traffic). I like keeping my feet near the ground during these maneuvers! You can also try small 'Trike' turns; keeping the bike upright at slow speed and making turns as you would in a parking lot. Be aware that if you get over the speed that the legs come up, they will!!! Another thing I like to do is donuts. Start out slow, lean the bike left or right, and make circles at very slow speeds (throttle on, rear brake on, clutch slipping… you know like the cops do!). This helps you get familiar with the wheels being on the springs and allowing a lean angle! Practice, practice, practice!! Enjoy your LegUp System!

LEGUP LITE - ADDENDUM

If you have a Lite System, there are a few differences in the wiring compared to our Regular system.

The plugs and their locations don't change at all! Instead of plugging in the computer to the twelve pin plug, the Relay-Pack gets plugged into this plug. The Relay-Pack will be attached with Velcro as the computer would have been in the same location.

On the LITE system there is no proximity sensor, so ignore the testing and mounting of this sensor, and realize that the three pin plug will be left without a mating connector. We keep this plug in the wiring harness in case you upgrade to a regular system in the future.

Using Your Lite System:

Unlike our Regular System, you don't turn the **LITE** system on, or adjust the legs as described in the **'Maintenance Mode'** section of the manual. When you turn your bike on, the LITE system is ready to go! Press and hold the left button to lower the wheels, press and hold the right button to raise them. No lights will flash; it is up to you to control the system manually!

Please use EXTREME Caution when using the LITE System! Keeping the wheels lowered at speeds over 9MPH can be dangerous. Since the system is manual, please don't allow its' operation to distract you from controlling the vehicle!

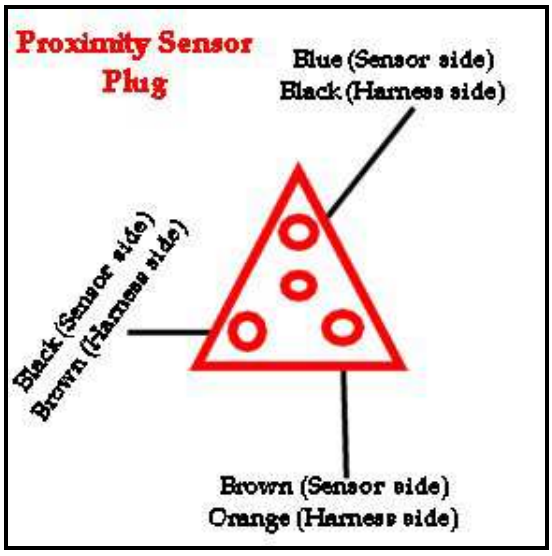
Upgrading Your LITE System:

If you have a LITE System and have chosen to upgrade it to the regular system, there are just a few things you need to do. Unplug the Relay-Pack, and plug the computer in where the Relay-Pack was attached. Run the wire for the proximity bracket and plug it in, test it, and mount it, as described in the '**MOUNT PROXIMITY SWITCH'** section of this manual.

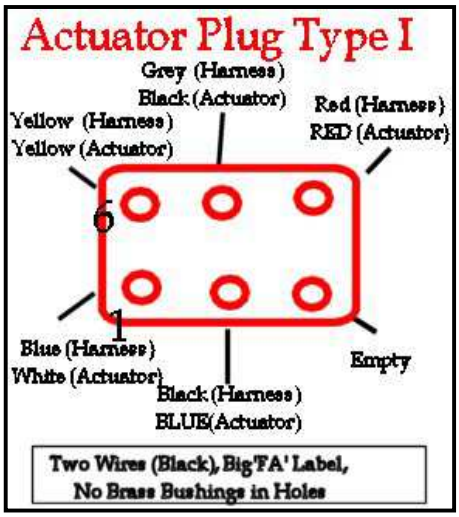
Once the new pieces are attached and plugged in, refer to '**ACTUATOR ADJUSTMENT (Maintenance Mode)',** earlier in this manual to set the lower and upper stops for the computer.

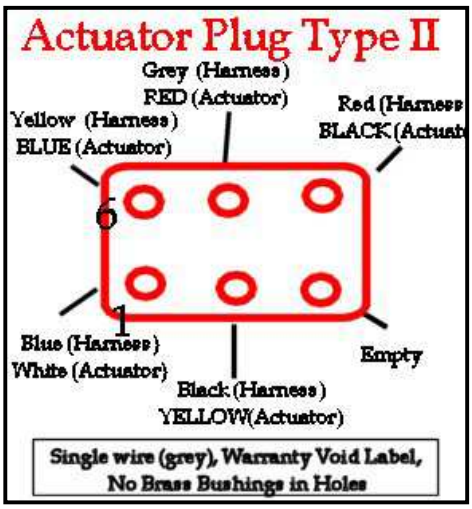
That's all it takes!

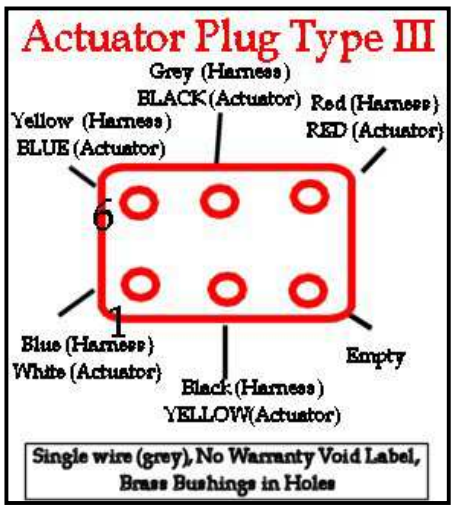
ILLUSTRATIONS



Wiring 1

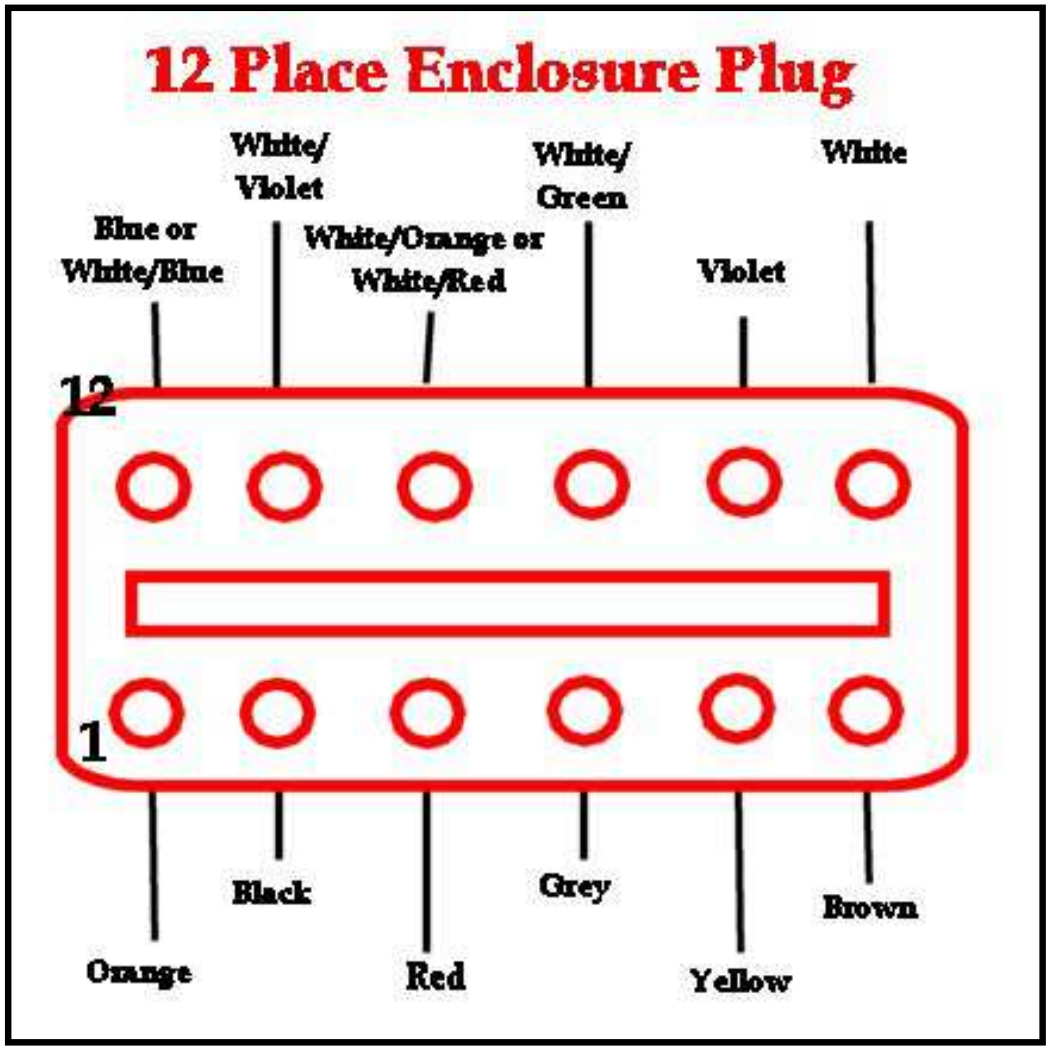






There are three different types of actuators with three different wiring configurations. Refer to the notes at the bottom of the pictures above so you can match your actuator with its wiring scheme!

Wiring 2


12 Place Enclosure Plug
White/
Violet
White/
Green
White
Blue or
White/Blue
White/Orange or
White/Red
Violet
12
1
Orange
Black
Red
Grey
Yellow
Brown

Wiring 3

VTX Parts List

(3) 3/8 – 16 X 1 Cad Bolts w Split Washers (Rear Mount Plate)
(2) 5/16 – 18 X ½” Cad Bolts w Split & Flat Washers (Front Mount Plate)
(3) 3/8” Fender Washers (Spacers for Right Rear Upright)
(2) 5/16 – 18 X 5/8” Chrome Bolts (Left Upright to Actuator Mount)
(2) 1/4X7/16X1/2” Chrome Spacers (Handlebar Mount)
(2) M6X40X1.0 Chrome Bolts (Handlebar Mount)
(1) M10X45X8.8 Hex Bolt (Right Rear Upright to Muffler Mount)
(1) M6X30X1.0 Chrome Bolt (Proximity Mount)

Wire Ties